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# PEST REPORT

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## GRAY SPRUCE LOOPER

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The following information is circulated in advance of a "Forest Pest Leaflet" to be completed after the current outbreak in southeastern British Columbia subsidies. This preliminary draft provides background information for use during the outbreak.

### INTRODUCTION

The gray spruce looper, Caripeta divisata Walker (Lepidoptera: Geometridae), is a defoliator of conifers in British Columbia. Except for a minor outbreak in 1961, with light defoliation of mature trees in the Zymoetz River area near Terrace, no significant damage by this insect had been previously recorded. However, in 1990 moderate to severe defoliation of western hemlock resulted in top kill mortality in southeastern British Columbia.

### DISTRIBUTION AND HOSTS

The gray spruce looper is transcontinental in its distribution across Canada and northern USA. No significant outbreaks have occurred beyond British Columbia. Although first identified on spruce, observations of population build-up and noticeable defoliation have been limited to stands of western hemlock. Residual feeding, occasionally severe, occurs on most associated conifers.

### DESCRIPTION AND LIFE HISTORY

Egg: About 1 mm long, elliptical, orange to brown, one to several on underside of needle laid from June to mid-July.

- Larva:** Up to 45 mm long when mature, gray to brown with off-white and/or yellow to green markings. Early instars mainly green. Moves by arching then straightening, characteristic of all loopers. Solitary feeders active from late July into October.
- Pupa:** Brown, about 16 mm long, over winter in ground.
- Adult:** Moths with an average wingspan of 32 mm (range 25-38 mm) fly from June to mid July. Forewings with brown proximal and distal margins, intermediate brown irregular band punctuated by a forward white spot. Hindwings white with an intermediate gray band.

#### DETECTION AND DAMAGE

Most defoliation occurs from September into early October as the larvae reach their largest size. Feeding is from the top of the trees down, resulting in varying degrees of dieback and occasional mortality of western hemlock when epidemic. Impact can be assessed the next growing season, after the full extent of bud flush is apparent and before any renewed feeding.

The current outbreak in southeastern British Columbia began in 1990 with moderate to severe defoliation in 24 infestations near Arrow, Slocan, Box and Duncan Lakes over a total of 1370 ha. Feeding in 1991 expanded to 34 infestations over 3850 ha, but declined to light or moderate intensity. All defoliation in both years occurred on flat or east-facing slopes next to lakes, suggesting a micro-climatic influence.

Stands severely defoliated in the first season of the current outbreak averaged 12% mortality of semi-mature western hemlock. Of the remaining live trees, 70% sustained dieback of the entire mid-crown. There were no hemlock killed in a stand moderately defoliated in 1990, but dieback of the entire upper crown occurred in 22% of the trees, and dieback of at least two-thirds of the upper crown in an additional 15%.

#### MANAGEMENT

No specific methods have been developed to manage this insect. A pheromone is being developed by researchers at Simon Fraser University, probably to be used for monitoring or forecasting populations. Methods of controlling other defoliators could probably be applied if high numbers of larvae are detected early enough. However, no agents are specifically registered against this insect.

The 1990-91 outbreak appears to be subsiding naturally as infections by native pathogenic fungi, Paecilomyces sp. and Entomophaga sp., increase. Larvae reared from collections made near Slocan and Arrow Lakes sustained an average of 72% mortality in 1991, up from 27% in 1990. These figures only approximate the field situation since some contamination of healthy larvae was likely during mass shipment and rearing in both years.

Although there are no precedents to suggest the course of this outbreak, defoliation in the Nelson Forest Region by other Gemometrid insects such as the larch looper and western hemlock looper, usually lasts from 1 to 3 years.